

Application Number 10/540770

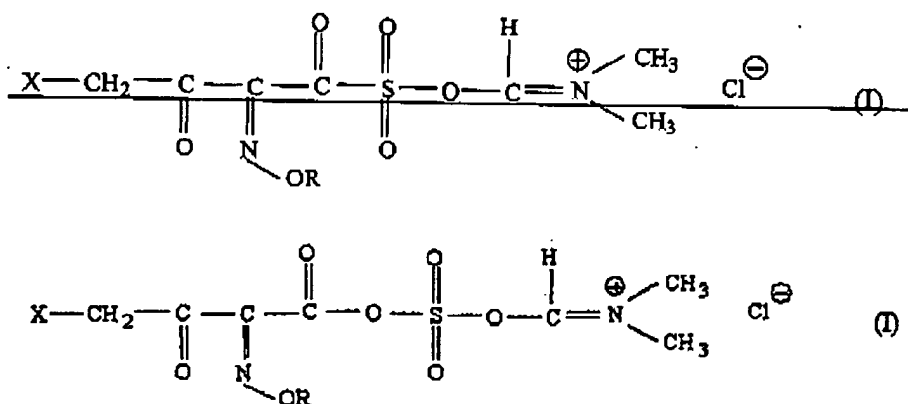
Response to the Office Action dated 03/20/2008

Amendments to the Abstract:

Please amend the abstract as follows:

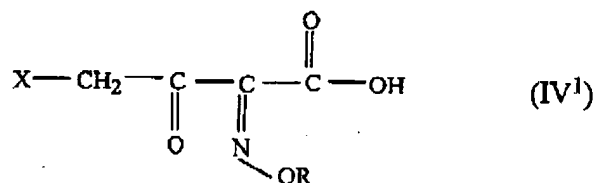
ABSTRACT

A novel 4-halo-2-oxyimino-3-oxo butyric acid-N, N-dimethyl formiminium chloride chlorosulfate of formula (I) useful in the preparation of cephalosporin antibiotics



wherein

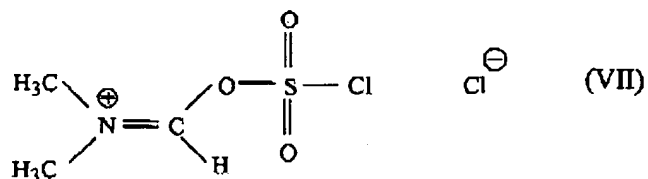
X is chlorine or bromine; R is hydrogen, C₁₋₄ alkyl group, an easily removable hydroxyl protective group, -CH₂COOR₅, or -C(CH₃)₂COOR₅, wherein R₅ is hydrogen or an easily hydrolysable ester group. The compound of formula (I) is prepared by reacting 4-halo-2-oxyimino-3-oxobutyric acid of formula (IV¹),



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wherein X, R and R₅ are as defined above, with N, N-dimethylformiminium chloride chlorosulphate of formula (VII)



in an organic solvent at a temperature ranging from -30°C to -15°C . The cephalosporins that may be prepared from the intermediate include cefdinir, cefditoren pivoxil, cefepime, cefetamet pivoxil, cefixime, cefmenoxime, cefodizime, cefoselis, cefotaxime, ceftiofur, cefpirome, cefpodoxime proxetil, cefquinome, ceftazidime, ceftazidime, ceftiofur, ceftizoxime, ceftriaxone and cefuzonam.